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Regulus, *Saturn* and *Mars* formed an interesting triangular group, the angle at *Saturn* being slightly obtuse. This angle remained sensibly the same throughout the observations, although the planets were separating.

W. E. Downs.

Mt. Hamilton, 1889, Sept. 22.

A VERY REMARKABLE COMET.

By Edward E. Barnard.

On the morning of July 7th, a small comet was discovered by Mr. Brooks in the constellation Cetus. The moon coming into the morning sky blotted the comet out before any observations (except three at the Lick Observatory) could be made of it. When a sufficiently long interval was obtained the orbit was computed, and from the small inclination of its path to that of the earth it was at once suspected to be periodic; the suspicion has since been verified, the comet having a period of about seven or eight years. This was sufficient of itself to make it of more than ordinary interest. While observing this object in the first part of August I discovered that it was attended by at least four companions, which were moving through space in advance of the main comet. Two of these companions were discovered with the twelve-inch on August 1st, and the other two on August 4th with the great telescope. These last two were seen several times, but always remained too faint to be measured, and finally disappeared.

The two brighter companions were perfect miniatures of the larger comet, each having a small, fairly well-defined head and nucleus, with a faint, hazy tail, the more distant one being the larger and less-developed. The three comets were in a straight line, nearly east and west, their tails lying along this line. There was no connecting nebulosity between these objects, the tails of the two smaller not reaching each other or the large comet. To all appearance they were absolutely independent comets. The four which were discovered here I have named B, C, D, E, in the order of increasing right ascension, A being the original comet discovered by Mr. Brooks. As D and E disappeared after a few observations, they will not be again referred to; they were both north following C and in a line with it.

Since discovery I have measured these objects on every available occasion, using the micrometer of the thirty-six-inch equatorial. It was found that these two were separating from the main comet quite rapidly; the more distant one moving the fastest. Towards the latter half of August the nearer companion B ceased to recede, and then underwent a remarkable change. It enlarged rapidly, becoming extremely diffused, and losing all appearance of central condensation. It could be measured only with the utmost difficulty. Throughout its visibility its position angle remained almost constant; towards the last, however, this angle began slowly but sensibly to increase as if the companion were in orbital motion. Unfortunately, at this most important point in the observations, the companion faded rapidly and totally from view, being last seen on the 5th of September. It disappeared as absolutely from the face of the heavens as did Biela's comet, which doubtless underwent a similar dissolution.

In the meantime the more distant companion continued to recede, and increased very much in brightness and size, until on August 31st it was perceptibly brighter than the larger comet! In the latter half of September it, too, became stationary with reference to the principal comet; remaining thus for some days, it began slowly to lessen its distance, having attained a maximum distance of 356″. This object has also undergone a change in appearance similar to that in the lost companion. Its tail has disappeared, and the head has become large and much diffused, its brightness in the meantime having diminished very greatly. The position angle of this object has remained remarkably constant for the past two months; it attained a maximum of about 62° in the middle of September; since then it has been slowly decreasing, until it is now the same as when first observed.

Measures of the companion B on twenty-two nights were obtained, and up to the present date measures of C have been made on forty nights.

The following, selected from the observations, will give an idea of the relative positions of this group:

° ″
Aug. 1. Position angle A and B, 59.4; distance A and B, 64.1.
Sept. 4. " " " " " 65.0 " " " " 71.5.
Aug. 4. " " A and C, 61.5 " A and C, 267.6.
Sept. 15. " " " " " 62.1 " " " " 356.4.
Sept. 30. " " " " " 61.4 " " " " 352.1.

It is hoped that through measures of the relative positions of these bodies we shall be enabled to detect orbital motion of the smaller ones about the larger. If this were shown to exist, we should at once have the means of determining the mass of this cometary system. These changes may, however, be due to perspective.

So far as we know, the phenomenon presented by this comet is extremely rare. It is needless to repeat the story of Biela's comet. In 1845 it separated into two distinct comets, which traveled side by side, and returning at the appointed time, they were seen to be widely separated—indeed, moving in distinctly separate paths; they then disappeared, to be seen no more in the heavens. One of the comets of 1861 was seen double for a few days. Some companions were seen moving with the Great Comet of 1882, but no measurements were made. This covers our knowledge of multiple comets, or comets with companions, unless, indeed, we accept the evidence of the Chinese records, which possibly describe comets that consisted of two or more parts.

MT. HAMILTON, September 30, 1889.

NOTE.—In order not to delay the publication of the present number, the printing of two papers on Drawings of *Jupiter* in the years 1875-1883, by Messrs. HOLDEN and BARNARD, is postponed to the next number.

NOTICES FROM THE LICK OBSERVATORY.

PREPARED BY MEMBERS OF THE STAFF.

PHOTOGRAPHING THE MILKY WAY.

The great success obtained by Mr. BARNARD in his preliminary experiments with the WILLARD portrait lens ($a = 5.9$, $f = 30.7$) has led to the determination to employ it in making a systematic study of the Milky Way by photography. For this purpose it has been mounted at the object-glass end of the tube of the great telescope, and arrangements made by which the lens can be capped and uncapped from the eye end. The driving clock of the great telescope (with a control) will keep the camera directed at the star-group chosen during an exposure of two hours. An independent equatorial stand for this instrument is very desirable, but cannot be had